

NOTES ON GEOGRAPHIC DISTRIBUTION

Insecta, Ephemeroptera: New and additional records from New York (U.S.A.)

Luke W. Myers¹
Luke M. Jacobus²
Boris C. Kondratieff¹

¹ Colorado State University. Department of Bioagricultural Sciences and Pest Management.
Fort Collins, Colorado 80523. E-mail: myersl@lamar.colostate.edu

² Indiana University. Department of Biology.
Bloomington, Indiana 47405.

Jacobus and McCafferty (2001b) listed 173 species of mayflies from New York, including 42 new state species records, of which 170 were considered valid taxa. Herein, we augment that list with nine new state species records (indicated by an asterisk, "*") and new collection data for species seldomly reported from the state. We also note recent changes to the taxonomy of New York Ephemeroptera and note other necessary emendations to the list of species records.

Taxa impacted by nomenclature changes since Jacobus and McCafferty's (2001b) list include all species formerly included in *Stenonema* Traver, excluding *S. femoratum* (Say), that are now part of the genus *Maccaffertium* Bednarik (Heptageniidae); *Heterocloeon amplum* (Traver), formerly included in *Acentrella* Bengtsson (Baetidae); and *Sparbarus lacustris* (Needham) and *Sparbarus maculatus* (Berner), formerly included *Brachycercus* Curtis (Caenidae) (Wang and McCafferty 2004, McCafferty et al. 2005, Sun and McCafferty 2008). Revisions to species in the genus *Ephemerella* Walsh (Jacobus and McCafferty 2003) reduced the total number of species known from the state, due to a broader concept of *Ephemerella invaria* (Walker) [= *E. rotunda* Morgan] and the acknowledgment of historical misidentifications of *Ephemerella excrucians* Walsh by J. G. Needham, which were based on "something entirely different and probably contains a mixture of species" (McDunnough 1931b). The Jacobus and McCafferty (2001b) New York record of *Epeorus frisoni* (Burks) is tentatively referable to *E. pleuralis* (Banks) (Burian et al. 2008). This New York specimen differs from typical northeastern

E. pleuralis, in that the posterior margin of the subgenital plate is distinctly indented. *Epeorus pleuralis* is known to show morphological variability, but the population that was misidentified as *E. frisoni* may require further investigation (S. Burian, pers. comm.). *Heptagenia marginalis* Banks was reported as a new state record by Jacobus and McCafferty (2001b), but in fact Traver (1935) reported it previously.

Thus, the number of presumably correctly identified and valid nominal species reported from New York before this study was 167. We note that reports of *Centroptilum triangulifer* (McDunnough) should be considered tentative as they might represent that species, *C. alamance* (Traver), or both species (Funk et al. 2006). The synonymy of *Ephemerella invaria* and *E. rotunda* is somewhat contentious (e.g., Chandler et al. 2006), as is the taxonomy of the *Drunella lata* complex (Jacobus and McCafferty 2004), which includes the species *Drunella lata* (Morgan), *D. cornuta* (Morgan), *D. cornutella* (McDunnough) and *D. longicornis* (Traver) (Funk et al. unpublished).

Our new data are based primarily on collections made by L. W. Myers (LWM) and B. C. Kondratieff (BCK) in eastern New York from 2006 through 2008 and are given in alphabetical order. Larval and adult mayfly specimens were obtained through standard collection methods, including kick netting, aerial and sweep netting, black light traps, and rearing. Rearing was conducted at Colorado State University, using a living stream (Frigid

NOTES ON GEOGRAPHIC DISTRIBUTION

Units, Inc., Toledo Ohio), in order to mimic stream condition in the lab and make accurate larval associations. All material reported is deposited in the C. P. Gillette Museum of Arthropod Diversity, Colorado State University, Fort Collins, Colorado (CSUC), Florida A&M University, Tallahassee, Florida (FAMU) or the New York State Museum, Albany, New York (NYSM).

With these new records, the total number of mayflies known from New York State stands at 176 valid species and three *nomen dubium*.

Species Accounts

Ameletidae

Ameletus tertius McDunnough

Previous Report: Unspecified County, Zloty (1996).

New Report: Greene Co., Stony Clove Creek, Lanesville, black light trap, 20 May 1978, 1 male adult, T. L. McCabe (NYSM). Hamilton Co., Silver Run, Limekiln Rd. (43°41'43" N, 74°36'06" W), 06 June 2008, 3 male adults, reared, 12 June 2008, LWM and R. Mowrey (CSUC); Washington Co., Stream off Little Buck Mountain, Shelving Rock Rd. (43°32'17" N, 73°34'21" W), 30 April 2008, 12 female adults, 12 sets exuviae, 3 larvae, reared, 20 May 2008, LWM (CSUC).

Remarks: The species ranges from the Canadian Maritime provinces south to the southern Appalachian mountains in the U.S.A. (Zloty 1996, DeWalt et al. 2007).

Arthropleidae

Arthroplea bipunctata (McDunnough)

Previous Report: Lewis Co., Jacobus and McCafferty (2001b).

New Reports: Clinton Co., Beaver Pond, 1.6 km N. of Fern Lake (44°30'33" N, 73°42'51" W), 12 May 2006, 4 larvae, LWM (CSUC); Essex Co., W. B. Ausable River Overflow, River Rd. nr. Jct. Rt. 86 (44°17'24" N, 73°56'03" W), 22 May 2007, 1 larva, LWM (CSUC); Pond at Stacy Brook, Spring Rd., SW Westport (44°08'49" N, 73°28'15" W), 23 May 2008, 1 larva, LWM, BCK, and R. W. Baumann (NYSM); S. B. Saranac River, Moose Pond Rd. Overflow (44°23'36" N, 74°03'24" W), 28 May 2007, 5

larvae, LWM and J. Mihuc (CSUC); Hamilton Co., Temporary Drainage to Governor Brook, Limekiln Rd. nr. Red River (43°42'03" N, 74°45'01" W), 29 June 2007, 37 larvae, LWM and BCK (CSUC); Red River, Limekiln Lake Rd. (43°41'24" N, 74°45'05" W), 6 June 2008, 2 larvae, LWM and R. Mowrey (CSUC); Lewis Co., Black River Irrigation Ditch, Rt. 812 Nr. Lowville (43°49'20" N, 75°27'43" W), 18 May 2007, 51 larvae, LWM (CSUC); same as previous, 18 May 2007, 9 male adults, 5 female adults, reared 15 June 2007, LWM (CSUC); Warren Co., Beaver Pond, Potter Brook, Potter Brook Rd. (43°33'55" N, 73°50'14" W), 11 May 2008, 4 larvae, LWM (CSUC); Schroon River Overflow, E. Schroon River Rd. Jct. Nest Rd. (43°40'56" N, 73°47'20" W), 15 May 2008, 1 female adult, reared, 25 May 2008, LWM and E. White (CSUC).

Remarks: This Holarctic species is distributed throughout eastern North America, but it has not been recorded south of 40° N latitude (Burian and Gibbs 1991). In the spring months this species was collected commonly from overflow areas and beaver ponds with little or no flow, and abundant coarse organic material. Mature larvae were collected until the end of June.

Baetidae

**Acentrella barbarae* Jacobus and McCafferty.

New Reports: Essex Co., W. B. Ausable River, Rt. 86 notch nr. Wilmington (44°20'27" N, 73°53'24" W), 28 July 2007, LWM, 1 larva (dissected parts in microvial) (CSUC).

Remarks: This record extends the known range of geographic distribution northwards from Tennessee and North Carolina, representing the first report of the species since its original description from Great Smoky Mountains National Park (Jacobus and McCafferty 2006).

Acentrella parvula (McDunnough)

Previous Report: Warren Co., Jacobus and McCafferty (2001b).

New Reports: Herkimer Co., S. B. Moose River, Rt. 28 nr. County Line (43°36'42" N, 75°06'09" W), 28 June 2007, 1 larva, LWM and BCK (CSUC).

Remarks: *Acentrella parvula* has a widespread distribution, ranging throughout Canada and the U.S.A (e.g., McCafferty et al. 2004).

NOTES ON GEOGRAPHIC DISTRIBUTION

Baetis rusticans McDunnough

Previous Report: St. Lawrence Co., Traver (1935).

New Report: Clinton Co., S. B. Saranac River, Silver Lake Rd. (44°35'28" N, 73°50'21" W), 3 August 2006, 1 male adult, LWM (CSUC); Greene Co., Kaaterskill Creek, High Falls Rd. Ext. 0.8 km S of 23A, black light trap (42°11'03" N, 73°58'17" W), 24 June 2007, 1 male adult, LWM and BCK (CSUC); Lewis Co., Independence River, Crossing Pine Grove Rd., black light trap (43°43'50" N, 75°21'55" W), 26 June 2007, 2 male adults, LWM and BCK (CSUC); Warren Co., Mill Cr. Rt. 8 nr. Weavertown (43°37'41" N, 73°56'41" W), 26 June 2007, 1 male adult, LWM and BCK (CSUC).

Remarks: These reports represent the first confirmed collections of *B. rusticans* from New York since Traver (1935) reported it from Fort Jackson in St. Lawrence County. This species has an apparently disjunct distribution that includes northeastern North America and Texas (McCafferty 2001). McCafferty (2001) reviewed past reports, including historic misidentifications; larvae are still unknown for this species.

**Centroptilum minor* McDunnough

New Reports: Franklin Co., Raquette River, Coreys Rd. nr. Axton Landing, black light trap (44°12'05" N, 74°19'01" W), 27 June 2007, 4 male adults, LWM and BCK (CSUC); Herkimer Co., S. B. Moose River, Rt. 28 nr. County Line (43°36'42" N, 75°06'09" W), 29 July 2007, 8 male adults, 3 larvae, LWM (CSUC); Warren Co., Schroon River, I-87 exit 24 (43°36'18" N, 73°43'41" W), 14 September 2007, 1 male adult, LWM (CSUC).

Remarks: New York is within a geographic range that has been established for this species by several recent reports. Elsewhere, *C. minor* has been reported from Quebec, Ontario, Maine, New Hampshire, North Carolina, Alabama, Missouri, Kansas, Oklahoma and Texas (McCafferty and Randolph 1998, Baumgardner and Kennedy 1999, Jacobus and McCafferty 2001a, McCafferty et al. 2004, Wiersema and McCafferty 2004; Chandler et al. 2006, McCafferty and Jacobus 2008). Chandler et al. (2006) regarded it as an Appalachian and Northeast Boreal species, but the reports from Kansas, Missouri, Oklahoma and Texas indicate that it is more widespread.

**Centroptilum victoriae* McDunnough

New Report: Franklin Co., N. B. Saranac River, Vernofskys Camp Rd. off Goldsmith Rd. (44°34'28" N, 73°59'11" W), 6 August 2006, 1 male adult, LWM (CSUC).

Remarks: New York is within the known geographic range of *C. victoriae*. This species has been reported previously from Nova Scotia, Ontario, Manitoba, Saskatchewan and Alberta in Canada and Vermont, Michigan, Indiana, Iowa, Wisconsin and Montana in the U. S. A. (McCafferty and Randolph 1998, McCafferty et al. 2003, 2004, Wiersema and McCafferty 2004). Chandler et al.'s (2006) reference to a Maine population of *C. semirufum* (McDunnough) is applicable to *C. victoriae*. Steve Burian (pers. comm.) kindly confirmed the misidentification by Burian and Gibbs (1991). Wiersema and McCafferty (2004) remarked that a report of *C. semirufum* from Maine was based on a misidentification of *C. victoriae*.

**Cloeon dipterum* (Linnaeus)

New Report: Clinton Co., Wetland, Silver Lake Rd. (44°35'26" N, 73°50'27" W), 14 June 2006, 2 male adults, reared, 25 July 2006, LWM (CSUC); Warren Co., Beaver Pond, Potter Brook, Potter Brook Rd. (43°33'55" N, 73°50'14" W), 11 May 2008, 1 male adult, 2 larvae, 1 set exuviae, reared, 15 May 2008, LWM (CSUC).

Remarks: *Cloeon dipterum* has a widespread Holarctic distribution (Randolph et al. 2002), and its occurrence in New York would have been expected.

**Plauditus cingulatus* (McDunnough)

New Reports: Herkimer Co., S. B. Moose River, Rt. 28 nr. County Line (43°36'42" N, 75°06'09" W), 29 July 2007, 4 larvae, LWM (CSUC). Warren Co., Hudson River, Glen Athol Rd. (43°34'41" N, 73°51'34" W), 26 June 2007, 8 larvae, LWM and BCK (CSUC).

Remarks: New York is within the presumed geographic range of *P. cingulatus*. The species has been reported previously from Quebec to South Dakota and south to Arkansas and North Carolina (McDunnough 1931a, McCoy and Hales 1974, Berner 1977, McCafferty and Provonsha 1978).

NOTES ON GEOGRAPHIC DISTRIBUTION

Procloeon mendax (Walsh)

Previous Report: Herkimer Co., Needham (1908).

New Report: Clinton Co., Wetland, Redford Sand Quarry, Ferrell Rd., black light trap (44°36'22" N, 73°49'24" W), 3 August 2006, 1 male adult, LWM (CSUC).

Remarks: This species has been reported infrequently from scattered localities in northeastern and midwestern North America (Wiersema and McCafferty 2004). Our record represents the first substantiated report of this species in New York since its initial report from the foot of First Lake in Herkimer County (Needham 1908).

Procloeon rivulare (Traver)

Previous Report: Wyoming Co., Jacobus and McCafferty, (2001b).

New Reports: Clinton Co., Ausable River, Rt. 9N 4.8 km W of Ausable Forks (44°27'19" N, 73°36'49" W), 27 June 2007, 2 male adults, LWM (CSUC); Essex Co., E. B. Ausable River, Rt. 9N nr. Rattlesnake Knob (44°20'51" N, 73°45'31" W), 27 June 2007, 1 male adult, LWM and BCK (CSUC).

Remarks: Previous distributional accounts of this widespread species range from the Canadian Maritime Provinces south along the Appalachians to Tennessee, and west to Kentucky, Mississippi, and Ohio (Wiersema and McCafferty 2004).

Procloeon rubropictum (McDunnough)

Previous Reports: Tompkins Co., Traver (1935), Allegany Co., Jacobus and McCafferty, (2001b).

New Report: Warren Co., Pack Forest Lake, Old Rt. 9 (43°33'00" N, 73°48'20" W) 26 June 2007, 1 larva, LWM, BCK, and R. Bode (CSUC).

Remarks: The known range of geographic distribution for *P. rubropictum* extends from Quebec and Ontario south to Florida and west to Illinois and Manitoba (Lowen and Flannagan 1992, Wiersema and McCafferty 2004).

Procloeon rufostrigatum (McDunnough)

Previous Report: Allegany Co., Jacobus and McCafferty (2001b).

New Report: Clinton Co., Wetland, Silver Lake Rd. (44°35'26" N, 73°50'27" W), 30 July 2005, 1 larva, LWM (CSUC).

Remarks: Previous reports of this widespread species range from New Brunswick and Quebec

south to Kentucky, and as far west as Texas and Manitoba (Lowen and Flannagan 1992, Wiersema and McCafferty 2004).

Baetiscidae

**Baetisca carolina* Traver

New Reports: Essex Co., Cold River, High Peaks Wilderness Area (44°05'18" N, 74°15'56" W), 11 May 2006, 3 larvae, LWM (FAMU); E. B. Ausable River, Aundrus Rd. Upper Jay (44°18'53" N, 73°47'10" W), 10 May 2006, 1 larva, LWM (FAMU).

Remarks: Our new records from New York supplement reports from within the known range of *B. carolina*, Quebec south to Georgia (McDunnough 1932, Pescador and Berner 1981). Chandler et al. (2006) regarded it as an Appalachian and Northeast Boreal species.

Ephemerellidae

Ephemerella aurivillii (Bengtsson)

Previous Report: Chemung Co., Jacobus and McCafferty (2001b).

New Reports: Clinton Co., Cold Brook, Standish Rd. High Banks (44°37'11" N, 73°54'10" W), 26 May 2006, 1 larva, LWM (CSUC); Essex Co., N. F. Boquet River, Rt. 73 (44°06'47" N, 73°42'83" W), 23 May 2007, 1 larva, LWM (CSUC); Essex Co., Stephenson Brook, Whiteface Memorial Highway (44°24'55" N, 73°54'40" W), 16 May 2007, 1 male adult, 2 female adults, reared, 27 May 2007, LWM (CSUC); Franklin Co., Dutton Brook, Rt. 3 nr. Saranac Lake (44°14'58" N, 74°14'18" W), 20 May 2006, 4 larvae, LWM (CSUC); same as previous, 20 June 2006, 1 male adult, LWM (CSUC).

Remarks: This Holarctic species is distributed across northern latitudes of North America, Europe and Asia. In North America there are two disjunct populations, a western population extending from Alaska south along the Cordillera to California, and an eastern population ranging from Labrador and Quebec south to New York and Pennsylvania and west along the Great Lakes to Ontario and Michigan (Allen and Edmunds 1965). During this survey larvae and adults were collected from colder streams and rivers.

Eurylophella lutulenta (Clemens)

Previous Report: Livingston Co., Traver (1935).

NOTES ON GEOGRAPHIC DISTRIBUTION

New Report: Clinton Co., Great Chazy River, Rt. 374 at Chazy Lake (44°46'17" N, 73°48'25" W), 28 May 2008, 2 larvae, LWM and R. Mowrey (CSUC).

Remarks: Previously reported distributional records for *E. lutulenta* extend from New Brunswick west to Wisconsin and south to Arkansas, Tennessee and North Carolina (Funk and Sweeney 1994). Although previously reported from New York by Traver (1935), records from this survey provide confirmation of the continued occurrence of this species in the state.

**Eurylophella prudentialis* (McDunnough)

New Reports: Clinton Co., Black Brook, Haselton Rd. nr. Town of Black Brook (44°27'04" N, 73°44'32" W), 16 May 2007, 1 larva, LWM (CSUC); Essex Co., S. B. Saranac River, Moose Pond Rd. Overflow (44°23'36" N, 74°03'24" W), 28 May 2007, 1 larva, 3 male adults, reared, 15 June 2007, LWM and J. Mihuc (CSUC); Lewis Co., Black River Beaches Bridge Boat Launch, Number Four Rd. nr. Lowville (43°46'29" N, 75°26'45" W), 18 May 2007, 1 male adult, reared June 3, 2007, LWM (CSUC); Black River Irrigation Ditch, Rt. 812 nr. Lowville (43°49'20" N, 75°27'43" W), 18 May 2007, 9 larvae, LWM (CSUC); Hessington Marsh, Greig Rd., Glenfield (43°42'39" N, 75°23'54" W), 22 May 2008, 2 male adults, 1 female adult, 3 larvae, 1 set exuviae, reared, 27 May 2008, LWM, BCK and R. W. Baumann (CSUC).

Remarks: These records fall within the known geographic range of *E. prudentialis*, which Chandler et al. (2006) considered to be an Appalachian and Midwestern species. The northern extent of its range includes Quebec and Minnesota, and the southern extent includes Kentucky and South Carolina (Funk and Sweeney 1994, Randolph and McCafferty 1998). Larvae of this species were collected commonly during spring and early summer from overflow areas and calm reaches of streams and rivers.

Heptageniidae

Leucrocota umbratica (McDunnough)

Previous Report: Tompkins Co., Jacobus and McCafferty (2001b).

New Reports: Greene Co., Trib to Schoharie Creek, Jct. Denning Rd. and Rt. 23A (42°13'09" N, 74°14'34" W), 25 June 2007, 1 male adult,

LWM and BCK (CSUC); Warren Co., Straight Brook, Peaceful Valley Rd., black light trap (43°39'46" N, 73°59'49" W), 25 June 2007, 46 male adults, 4 female adults, LWM and BCK (CSUC).

Remarks: The distribution of this species extends from Quebec to Pennsylvania, west to Manitoba and Arkansas (McDunnough 1931a, Peters and Warren 1966, McCafferty and Provonsha 1978; Flannagan and Flannagan 1984, Grant et al. 1997).

Maccaffertium meririvulanum (Carle & Lewis)

Previous Reports: Cattaraugus Co., Greene Co., Jacobus and McCafferty (2001b).

New Reports: Clinton Co., Casey Brook, Casey Rd. (44°31'60" N, 73°53'43" W), 17 May 2007, 3 larvae, LWM (CSUC); Essex Co., Pettigrew Brook, Bonniview Rd nr. Wilmington, black light trap (44°25'49" N, 73°48'04" W), 26 June 2007, 1 male adult, LWM and BCK (CSUC); Franklin Co., Dutton Brook, Rt. 3 nr. Saranac Lake (44°14'58" N, 74°14'18" W), 20 May 2006, 1 larva, LWM, (CSUC); same as previous, 20 June 2006, 1 male adult, LWM (CSUC); same as previous, 21 June 2006, 1 larva, LWM (CSUC); same as previous, 27 June 2007, 2 male adults, 1 female adult, LWM and BCK (CSUC).

Remarks: Previous records of this Appalachian species range from New York south to Alabama and Georgia (Carle and Lewis 1978, Bednarik and McCafferty 1979, Kondratieff and Harris 1986, Randolph and McCafferty 1998). During this study adults and mature larvae were collected in May and June from spring-fed first order streams.

Nixe rusticalis (McDunnough)

Previous Reports: Tompkins Co., Traver (1935).

New Reports: Greene Co., Kaaterskill Creek, High Falls Rd. Ext. 0.8 km S of 23A, black light trap (42°11'03" N, 73°58'17" W), 24 June 2007, 2 male adults, LWM and BCK (CSUC); Schoharie Creek, Jct. Denning Rd. and Rt. 23A (42°13'01" N, 74°14'34" W), 25 June 2007, 1 male adult, LWM and BCK (CSUC); Warren Co., E. B. Sacandaga River, Rt. 30 mm 1022, black light trap (43°31'33" N, 74°08'58" W), 25 June 2007, 1 male adult, LWM and BCK (CSUC).

Remarks: Our records represent the first reports of this species from New York since Traver (1935) reported it from Tompkins County at Enfield,

NOTES ON GEOGRAPHIC DISTRIBUTION

Taughannock Glens, and Ithaca. It has been reported elsewhere in North America, ranging from Quebec (McDunnough 1931a) to Saskatchewan (Whiting and Sheard 1990) and Alabama (Kondratieff and Harris 1986).

Rhithrogena amica Traver

Previous Reports: Tompkins Co., Traver (1935); Livingston Co., Jaccobus and McCafferty (2001b).

New Reports: Clinton Co., S. B. Saranac River, Silver Lake Rd., black light trap (44°35'28" N, 73°50'21" W), 27 May 2007 1 male adult, LWM (CSUC); Essex Co., W. B. Ausable River, Rt 86 in Wilmington, black light trap (44°23'20" N, 73°49'06" W), 26 June 2007, 3 male adults, LWM and BCK (CSUC); Franklin Co., N. B. Saranac River, Loon Lake Rd. (44°32'21" N, 74°03'06" W), 30 May 2006, 1 male adult, 1 female adult, LWM (CSUC); Warren Co., Straight Brook, Peaceful Valley Rd., black light trap (43°39'46" N, 73°59'49" W), 25 June 2007, 2 male adults, LWM and BCK (CSUC).

Remarks: This species has been recorded from scattered localities ranging from Quebec (Dulude 1992) to Georgia (Berner 1977).

Rhithrogena anomala McDunnough

Previous Reports: Clinton Co., St. Lawrence Co., Traver (1935); Onondaga Co., Jacobus and McCafferty (2001b).

New Report: Clinton Co., S. B. Saranac River, Silver Lake Rd. (44°35'28" N, 73°50'21" W), 3 July 2006, 1 male adult, LWM (CSUC).

Remarks: Previous distributional accounts of this species range from Quebec south along the Appalachians to Alabama (McDunnough 1928, Harris et al. 1996). It also has been reported from Manitoba (Jacobus and McCafferty 2001a).

**Rhithrogena impersonata* (McDunnough)

New Reports: Clinton Co., True Brook, True Brook Rd. Saranac (44°38'14" N, 73°46'06" W), 24 May 2007, 1 male adult, LWM (CSUC); Essex Co., S. Fork Boquet River Rt. 73 (44°06'16" N, 73°41'33" W), 19 May 2006, 1 male adult, LWM (CSUC); Franklin Co., N. B. Saranac River, Loon Lake Rd. (44°32'21" N, 74°03'06" W), 28 May 2007, 2 male adult, LWM and J. Mihuc (CSUC).

Remarks: This species ranges from Quebec to Oklahoma (McDunnough 1925, McCafferty et al.

1997). Within this range, Randolph and McCafferty (1998) noted a “disjunct Great Lakes and Appalachian Plateau distribution pattern. Chandler et al. (2006) regarded it as a primarily Appalachian and Northeastern Boreal species.

**Rhithrogena jejuna* Eaton

New Reports: Clinton Co., True Brook, True Brook Rd. Saranac (44°38'14" N, 73°46'06" W), 21 May 2006, 1 male adult, LWM (CSUC); Essex Co., E. B. Ausable River, Aundrus Rd. Upper Jay (44°18'53" N, 73°47'10" W), 21 May 2006, 1 male adult, LWM (CSUC); Trib to Barton Brook, Old Military Rd. 2.4 km from Lord Rd. off Rt. 9, 44.2348N 73.6207W, May 23, 2008, 6 male adults, reared, 30 May 2008, LWM, BCK, and R. W. Baumann (CSUC); W. B. Ausable River Notch on rt 86 near Wilmington (44°20'27" N, 73°53'24" W), 24 May 2006, 2 male adults, LWM (CSUC); Franklin Co., N. B. Saranac River, Loon Lake Rd. (44°32'21" N, 74°03'06" W), 30 May 2006, 1 male adult, LWM (CSUC); Warren Co., E. B. Sacandaga River, Rt. 30 mm 1022, black light trap (43°31'33" N, 74°08'58" W), 25 June 2007, 1 male adult, LWM and BCK (CSUC).

Remarks: This species is known to occur throughout Canada (McCafferty and Randolph 1998, Jacobus and McCafferty 2001a) and in the U.S.A, as far south as Oklahoma (McCafferty et al. 1997, Randolph and McCafferty 1998, McCafferty et al. 2003). Chandler et al. (2006) regarded *R. jejuna* as an Appalachian and Northeastern Boreal species.

Stenacron pallidum (Traver)

Previous Reports: Wyoming Co., Jaccobus and McCafferty (2001b).

New Reports: Clinton Co., Main Stem Saranac River, Pup Hill Rd. (44°36'39" N, 73°47'29" W), 19 June 2006, 1 larva, LWM (CSUC); Franklin Co., N. B. Saranac River, Goldsmith Rd. (44°33'24" N, 74°01'33" W), 29 May 2006, 1 larva, LWM (CSUC); Herkimer Co., S. B. Moose River, Rt. 28 nr. County Line (43°36'42" N, 75°06'09" W), 28 June 2007, 1 larva, LWM and BCK (CSUC).

Remarks: The range of this Appalachian species extends from Maine (Burian and Gibbs 1991) and New York (Jacobus and McCafferty 2001b), south along the Appalachians to North Carolina (Lewis 1974).

NOTES ON GEOGRAPHIC DISTRIBUTION

Leptophlebiidae

Leptophlebia johnosni McDunnough

Previous Reports: Franklin Co., St. Lawrence Co., Burian (2001).

New Reports: Clinton Co., Beaver Pond, Bernau Brook, Standish Rd. Nr. High Banks (44°36'41" N, 73°53'40" W), 14 May 2008, 1 male adult, 1 larva, reared, 18 May 2008, LWM (CSUC); Same as previous, 14 May 2008, 1 male

adult, reared, 30 May 2008, LWM (CSUC).

Remarks: Previous accounts of this species range from the Canadian Maritime Provinces south to North Carolina and South Carolina (Burian 2001). *Leptophlebia johnsoni* has been collected infrequently in some portions of its range, and was listed as endangered in Virginia (Kondratieff and Kirchner 1991, Burian 2001).

Acknowledgments

We would like to thank the following individuals for their assistance in various aspects of this study, including Dr. Tim L. McCabe, New York State Museum, Albany, New York. David H. Funk, Stroud Watershed Research Center, Avondale Pennsylvania determined Eurylophella specimens, Dr. Manuel L. Pescador, Florida A&M University, Tallahassee, Florida, confirmed the Baetisca specimens, and Dr. Steven K. Burian, Southern Connecticut State University, New Haven, Connecticut provided additional verification and determination of material presented in this paper. Dr. Tim B. Mihuc, Plattsburgh State University, Plattsburgh, New York provided logistical support for field sampling in New York State. Additionally, Dr. Janet R. Mihuc, Paul Smith's College, Robert W. Bode, New York State Stream Biomonitoring Unit, and Paul G. Novak, New York State DEC, provided assistance in the field. This research was made possible by a grant funded by the New York State Biodiversity Research Institute, Albany, New York.

Literature Cited

- Allen, R. K. and G. F. Edmunds. 1965. A revision of the genus *Ephemerella* (Ephemeroptera: Ephemerellidae) VIII. The subgenus *Ephemerella* in North America. Miscellaneous Publications of the Entomological Society of America 4 (6): 244-282.
- Baumgardner, D. E. and J. H. Kennedy. 1999. Mayflies (Insecta: Ephemeroptera) of the Kiamichi River Watershed, Oklahoma. Journal of the Kansas Entomological Society 72: 297-305.
- Bednarik, A. F. and W. P. McCafferty. 1979. Biosystematic revision of the genus *Stenonema* (Ephemeroptera: Heptageniidae). Canadian Bulletin of Fisheries and Aquatic Sciences 201: 1-73.
- Berner, L. 1977. Distributional patterns of southeastern mayflies (Ephemeroptera). Bulletin of the Florida State Museum (Biological Sciences) 22: 1-55.
- Burian, S. K. 2001. A revision of the genus *Leptophlebia* Westwood in North America (Ephemeroptera: Leptophlebiidae: Leptophlebiinae). Ohio Biological Survey Bulletin NS 13(3): i-v + 1-80.
- Burian, S. K. and K. E. Gibbs. 1991. Mayflies of Maine: an annotated faunal list. Maine Agricultural Experiment Station, Technical Bulletin 142: 109pp.
- Burian, S. K., B. I. Swartz and P. C. Wick. 2008. Taxonomy of *Epeorus frisoni* (Burks) and a key to New England species of *Epeorus*; p. 277-294
- In International advances in the ecology, zoogeography and systematics of mayflies and stoneflies. Frederick Richard Hauer, Jack Arthur Stanford and Robert Lee Newell (ed.). University of California Publications in Entomology, vol. 128. Available online, <http://repositories.cdlib.org/ucpress/ucpe/vol_128_InternationalAdvances_MayfliesandStoneflies>.
- Carle, F. L. and P. A. Lewis. 1978. A new species of *Stenonema* (Ephemeroptera: Heptageniidae) from eastern North America. Annals of the Entomological Society of America 71: 285-288.
- Chandler, D. S., G. D. Whitmore, S. K. Burian, and J. F. Burger. 2006. The mayflies (Ephemeroptera) of New Hampshire: Seasonality and diversity of the stream fauna. Transactions of the American Entomological Society 132: 25-73.
- DeWalt, R. E., L. M. Jacobus and W. P. McCafferty. 2007. Summer Ephemeroptera, Plecoptera, and Trichoptera from southwestern drainages in Great Smoky Mountains National Park, with additional Ephemeroptera records. Proceedings of the Entomological Society of Washington 109: 136-154.
- Dulude, Y. 1992. Les ephemeres du pecheur Quebecois. Les Editions de l'Homme, Montreal. 402 pp.

NOTES ON GEOGRAPHIC DISTRIBUTION

- Flannagan, P. M. and J. F. Flannagan. 1984. The post-glacial origin and present distribution of the mayflies (Ephemeroptera) of Manitoba, Canada; p. 149-169 *In* Proceedings of the Fourth International Conference on Ephemeroptera. Landa, V., T. Soldán and M. Tonner (ed.). Institute of Entomology, Czechoslovak Academy of Sciences, České Budejovice.
- Funk, D.H. and B.W. Sweeney. 1994. The larvae of eastern North American *Eurylophella* Tiensuu (Ephemeroptera: Ephemerellidae). Transactions of the American Entomological Society 120: 209-286.
- Funk, D. H., J. K. Jackson, and B. W. Sweeney. 2006. Taxonomy and genetics of the parthenogenetic mayfly *Centroptilum triangulifer* and its sexual sister *Centroptilum alamance* (Ephemeroptera: Baetidae). Journal of the North American Benthological Society 25: 417–429.
- Grant, P., S. K. Burian and E. C. Masteller. 1997. Emergence of mayflies (Ephemeroptera) from streams of Erie Co., PA. Journal of the Pennsylvania Academy of Science 70:105-112.
- Harris, S. C., B. C. Kondratieff, and B. P. Stark. 1996. New records of Ephemeroptera, Plecoptera and Trichoptera from Alabama. Entomological News. 107: 237-242.
- Jacobus, L. M. and W. P. McCafferty. 2001a. Additions to the Canadian Ephemeroptera. Journal of the New York Entomological Society 109: 367-371.
- Jacobus, L. M. and W. P. McCafferty. 2001b. The mayfly fauna of New York State (Insecta: Ephemeroptera). Journal of the New York Entomological Society 109: 47-80.
- Jacobus, L. M. and W. P. McCafferty. 2003. Revisionary contributions to North American *Ephemerella* and *Serratella* (Ephemeroptera: Ephemerellidae). Journal of the New York Entomological Society 111: 174-193.
- Jacobus, L. M. and W. P. McCafferty. 2004. Revisionary contributions to the genus *Drunella* (Ephemeroptera: Ephemerellidae). Journal of the New York Entomological Society 112: 127-147.
- Jacobus, L. M. and W. P. McCafferty. 2006. A new species of *Acentrella* Bengtsson (Ephemeroptera: Baetidae) from Great Smoky Mountains National Park, USA. Aquatic Insects 28: 101-111.
- Kondratieff, B. C. and S. C. Harris. 1986. Preliminary checklist of the mayflies (Ephemeroptera) of Alabama. Entomological News 97: 230-236.
- Kondratieff, B. C. and R. F. Kirchner. 1991. Mayflies, Class Insecta: Order Ephemeroptera: Subphylum Tracheata; p. 194-197 *In* Virginia's Endangered Species. Karen Terwillings (ed.). McDonald and Woodward Publishing Company. Blacksburg, Virginia. 680 pp.
- Lewis, P. A. 1974. Taxonomy and ecology of *Stenonema* mayflies (Heptageniidae: Ephemeroptera). Environmental Monitoring Series Report. EPA-670/4-74-006: 1-81.
- Lowen, R. G. and J. F. Flannagan. 1992. Nymphs and imagoes of four North American species of *Procloeon* Bengtsson with descriptions of a new species (Ephemeroptera: Baetidae). Canadian Entomologist 124: 97-108.
- McCafferty, W. P. 2001. Notes on distribution and orthography associated with some poorly known North American mayflies (Ephemeroptera). Entomological News 112: 121-122.
- McCafferty, W.P. and A May Provonsa. 1978. The Ephemeroptera of mountainous Arkansas. Journal of the Kansas Entomological Society 51: 360-379.
- McCafferty, W. P. and R. P. Randolph. 1998. Canada mayflies: A faunistic compendium. Proceedings of the Entomological Society of Ontario 129: 47-97.
- McCafferty, W.P., R.K. Heth, and R.D. Waltz. 1997. The Ephemeroptera of Spring Creek, Oklahoma, with remarks on notable records. Entomological News 108: 193-200.
- McCafferty, W. P., T. Hubbard, T. H. Klubertanz, R. P. Randolph, and M. Birmingham. 2003. Mayflies (Ephemeroptera) of the Great Plains. II: Iowa. Transactions of the American Entomological Society 129: 77-105.
- McCafferty, W. P., M. D. Meyer, J. M. Webb, and L. M. Jacobus. 2004. New state and provincial records for North American small minnow mayflies (Ephemeroptera: Baetidae). Entomological News 115: 93-100.
- McCafferty, W. P., R. D. Waltz, J. M. Webb, and L. M. Jacobus. 2005. Revision of *Heterocloeon* McDunnough (Ephemeroptera: Baetidae). Journal of Insect Science 5 (35): 1-11.
- McCafferty, W. P. and L. M. Jacobus. 2008. Insecta, Ephemeroptera, Baetidae: Range extensions and new state records from Kansas, U.S.A. Check List 4: 92-97.
- McCoy, R.W. and D.C. Hales. 1974. A survey of eight streams in eastern South Dakota: Physical and chemical characteristics, vascular plants, insects, and fishes. Proceedings of the South Dakota Academy of Science 53: 202-219.
- McDunnough, J. 1925. New Canadian Ephemeridae with notes, III. Canadian Entomologist 57: 168-176, 185-192.
- McDunnough, J. 1928. Ephemerid notes with description of a new species. Canadian Entomologist 60: 238-240.
- McDunnough, J. 1931a. New species of North American Ephemeroptera. Canadian Entomologist 63: 82-93.

NOTES ON GEOGRAPHIC DISTRIBUTION

- McDunnough, J. 1931b. The eastern North American species of the genus *Ephemerella* and their nymphs (Ephemeroptera). Canadian Entomologist 63: 187-197, 201-216, plates 12-14.
- McDunnough, J. 1932. New species of North American Ephemeroptera II. Canadian Entomologist 64: 78-81.
- Needham, J. G. 1908. New data concerning may flies and dragon flies of New York. New York State Museum Bulletin 124 (1907): 188-195.
- Pescador, M. L. and L. Berner. 1981. The mayfly family Baetiscidae (Ephemeroptera). Part II Biosystematics of the genus *Baetisca*. Transactions of the American Entomological Society 107: 163-228.
- Peters, W. L. and L. O. Warren. 1966. Seasonal distribution of adult Ephemeroptera in northwestern Arkansas. Journal of the Kansas Entomological Society 39: 396-401.
- Randolph, R. P. and W. P. McCafferty. 1998. Diversity and distribution of the mayflies (Ephemeroptera) of Illinois, Indiana, Kentucky, Michigan, Ohio, and Wisconsin. Ohio Biological Survey Bulletin NS 13(1): i-vii + 1-188.
- Randolph, R. P., W. P. McCafferty, D. Zaranko, L. M. Jacobus and J. M. Webb. 2002. New Canadian records of Baetidae (Ephemeroptera) and adjustments to North American Cloeon. Entomological News 113: 306-309.
- Sun, L. and W. P. McCafferty. 2008. Cladistics, classification and identification of the brachycercine mayflies (Insecta: Ephemeroptera: Caenidae). Zootaxa 1801: 1-239.
- Traver, J. R. 1935. Part II: Systematic; p. 237-739 In J. G. Needham, J. R. Traver, and Y. C. Hsu. The biology of mayflies, with a systematic account of North American species. Ithaca, Comstock Publishing
- Wang, T. Q. and W. P. McCafferty. 2004. Heptageniidae (Ephemeroptera) of the world. Part I: Phylogenetic higher classification. Transactions of the American Entomological Society 130: 11-45.
- Whiting, E. R. and J. W. Sheard. 1990. Patterns in the distribution of heptageniid species in Saskatchewan, Canada. Freshwater Biology 24: 143-157.
- Wiersema, N. A. and W. P. McCafferty. 2004. New specific synonyms and records of North American *Centroptilum* and *Procloeon* (Ephemeroptera: Baetidae). Entomological News 115: 121-128.
- Zloty, J. 1996. A revision of the Nearctic *Ameletus* mayflies based on adult males, with descriptions of seven new species (Ephemeroptera: Ameletidae). Canadian Entomologist. 128: 293-346.

Received July 2008

Accepted September 2008

Published online October 2008